

We claim:

1. A method performed by a GPS receiver of  
5 processing GPS data comprising:

acquiring GPS data from at least one GPS satellite, wherein the GPS data is useful in determining GPS position of the GPS receiver;

10 performing acquisition functions in the frequency domain based on the GPS data, wherein the acquisition functions produce acquisition results, and wherein the performing of the acquisition functions cause a delay in handing over the acquisition results to a tracking function;

15 propagating the acquisition results forward in time by an amount of time substantially equal to the delay; and,

handing over the propagated acquisition results to the tracking function.

20

2. The method of claim 1 wherein the propagating of the acquisition results forward in time comprises propagating the acquisition results forward in time according to inertial navigation data.

3. The method of claim 2 further comprising providing the inertial navigation data to the GPS receiver from an inertial measurement unit.

5

4. The method of claim 2 further comprising providing the inertial navigation data to the GPS receiver from an inertial navigation system.

10

5. The method of claim 1 wherein the handing over of the propagated acquisition results to the tracking function comprises:

15

determining an updated code offset and an updated frequency offset based on the propagated acquisition results;

handing over the updated code offset and the updated frequency offset change to the tracking function.

20

6. The method of claim 5 wherein the propagating of the acquisition results forward in time comprises propagating the acquisition results forward in time according to inertial navigation data.

7. The method of claim 6 further comprising providing the inertial navigation data to the GPS receiver from an inertial measurement unit.

5 8. The method of claim 6 further comprising providing the inertial navigation data to the GPS receiver from an inertial navigation system.

9. The method of claim 5 wherein the  
10 propagated acquisition results include a GPS position and rate of the GPS receiver, wherein the determining of an updated code offset comprises determining the updated code offset based upon a change between the GPS position at the end of the performing of the acquisition functions  
15 and a GPS position at the start of the performing of the acquisition functions, and wherein the determining of an updated frequency offset comprises determining the updated frequency offset based upon a change between the rate at the end of the performing of the acquisition  
20 functions and a rate at the start of the performing of the acquisition functions.

10. The method of claim 1 wherein the propagated acquisition results include a GPS position and rate of the GPS receiver.

5 11. The method of claim 1 wherein the performing of acquisition functions comprises performing the acquisition functions in software.

12. The method of claims 1 wherein the  
10 acquisition functions include frequency downconversion.

13. A method performed by a GPS receiver of processing GPS data comprising:

- a) acquiring GPS data from at least one GPS  
15 satellite;
- b) determining a code offset based on the acquired GPS data;
- c) determining a frequency offset based on the acquired GPS data;
- d) determining a change in GPS position of the  
20 GPS receiver during the determination of the code offset;
- e) determining a change in rate of the GPS receiver during the determination of the frequency offset;

- f) determining an updated code offset based on the code offset determined at b) and the change in GPS position;
- g) determining an updated frequency offset based on the frequency offset determined at c) and the change in rate; and,
- h) handing over the updated code offset and the updated frequency offset to a tracking function.

10                 14. The method of claim 13 wherein the change in GPS position and the change in rate are determined in accordance with inertial navigation data.

15                 15. The method of claim 14 further comprising providing the inertial navigation data to the GPS receiver from an inertial measurement unit.

20                 16. The method of claim 14 further comprising providing the inertial navigation data to the GPS receiver from an inertial navigation system.

17. The method of claim 13 wherein the acquiring of GPS data comprises downconverting the GPS data.

18. The method of claim 17 wherein the downconverting of the GPS data comprises downconverting the GPS data in the frequency domain.

5

19. The method of claim 13 wherein the determining of a code offset comprises determining the code offset in the frequency domain, and wherein the determining of a frequency offset comprises determining 10 the frequency offset in the frequency domain.

20. The method of claim 19 wherein the acquiring of GPS data comprises downconverting the GPS data.

15

21. The method of claim 20 wherein the downconverting of the GPS data comprises downconverting the GPS data in the frequency domain.

22. A method performed by a GPS receiver of processing GPS data comprising:

downconverting and sampling a GPS signal from at least one GPS satellite to produce digital GPS data;

5 determining parameters related to position and rate of the GPS receiver from the digital GPS data;

determining a change in the position and rate of the GPS receiver between a start of the determination of the parameters and an end of the determination of the 10 parameters;

updating the parameters in accordance with the change in the position and rate; and,

handing over the updated parameters to a tracking function.

15

23. The method of claim 22 wherein the determining of a change in the position and rate of the GPS receiver comprises determining a change in the position and rate of the GPS receiver according to 20 inertial data.

24. The method of claim 23 further comprising providing the inertial data to the GPS receiver from an inertial measurement unit.

25. The method of claim 23 further comprising providing the inertial data to the GPS receiver from an inertial navigation system.

5

26. The method of claim 22 wherein the determining of parameters related to position and rate of the GPS receiver comprises:

determining a code offset based on position;  
10 and,

determining a frequency offset based on rate.

27. The method of claim 26 wherein the updating of the parameters in accordance with the change 15 in the position and rate comprises:

determining an updated code offset based on the change in the position; and,

determining an updated frequency offset based on the change in the rate.

20

28. The method of claim 27 wherein the handing over of the updated parameters to a tracking function comprises handing over the updated code offset and the updated frequency offset to the tracking function.

29. The method of claim 28 wherein the determining of an updated code offset comprises determining the updated code offset according to inertial 5 navigation data, and wherein the determining of an updated frequency offset comprises determining the updated frequency offset according to the inertial navigation data.

10 30. The method of claim 29 further comprising providing the inertial data to the GPS receiver from an inertial measurement unit.

15 31. The method of claim 29 further comprising providing the inertial data to the GPS receiver from an inertial navigation system.

20 32. The method of claim 22 wherein the determining of parameters related to position and rate of the GPS receiver comprises determining the parameters in the frequency domain.